UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,072	04/20/2001	Kim Cascone	A1SJ1891US	2723

7590 04/19/2004

KOPPEL & JACOBS
AN ASSOCIATION OF PROFESSIONAL LAW CORPORATIONS
555 ST. CHARLES DRIVE, SUITE 107
THOUSAND OAKS, CA 91360

EXAMINER	
MICHALSKI, JUSTIN I	

ART UNIT	PAPER NUMBER
2644	6

DATE MAILED: 04/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/839,072	CASCONE ET AL.	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23,26-28,30-52,55-57* is/are rejected.

7)☒ Claim(s) *24,25,29,53,54 and 58* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 5.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-12 and 30-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Koike et al. (US Patent 5,635,903).

Regarding Claim 1, Koike discloses a method of synthesizing sound signals associated with a vehicle having an engine (Figure 1), comprising: providing at least one engine control parameter which characterizes a corresponding vehicle operating condition other than an engine operating condition (vehicle speed sensor 2C), generating at least one engine related sound signal corresponding to said engine control parameter (rotational speed sensor 2B), and generating at least one vehicle sound signal corresponding to said vehicle control parameter (signal 12a).

Regarding Claim 2, Koike further discloses said vehicle control parameter comprises vehicle speed (speed sensor 2C).

Regarding Claim 3, Koike further discloses vehicle sound signal corresponding to vehicle speed comprising at least one of road noise, wind noise, tire noise, and water noise. (Koike discloses sound signal 5b is a function of vehicle speed 2C and noise sensor 10 which detects ambient noise (i.e. road, wind, tire, and water noise) (Column 2, lines 13-15).

Regarding Claim 4, Koike further discloses said engine related and vehicle sound signals are controlled independently (controlled by independent sensors 2A, 2B, 2C, and 2D).

Regarding Claim 5, Koike further discloses engine related and vehicle sound signals are mixed together to produce a combined audio output (mixed together in level selector 13 to produce output of device 5).

Regarding Claim 6, Koike further discloses at least some of said engine control and vehicle control parameters are dynamically varying (It is inherent that vehicle speed and rotational speed will vary dynamically).

Regarding Claim 7, Koike further discloses said engine related and vehicle sound signals are generated concurrently (sensors 2B and 2C control sound selector 12).

Regarding Claim 8, Koike discloses a method of synthesizing sound signals associated with a vehicle having an engine (Figure 1), comprising: providing at least one vehicle control parameter which characterizes a corresponding vehicle operating condition other than an engine operating condition (vehicle speed sensor 2C), and generating at least one respective vehicle sound signal corresponding to said vehicle control parameters (signal 12a).

Regarding Claim 9, Koike further discloses at least one of said vehicle control parameters comprising vehicle speed (vehicle speed sensor 2C).

Regarding claim 10, Koike further discloses vehicle sound signal corresponding to vehicle speed comprising at least one of road noise, wind noise, tire noise, and water noise. (Koike discloses sound signal 5b is a function of vehicle speed 2C and noise

sensor 10 which detects ambient noise (i.e. road, wind, tire, and water noise) (Column 2, lines 13-15).

Regarding Claim 11, Koike further discloses multiple vehicle sound signals (signals 2a, 2b, 2c, and 2d) are generated and mixed together (sound level selector 13) to produce a combined audio output (output from speaker 9).

Regarding Claim 12, Koike further discloses at least some of said vehicle control parameters are dynamically varying (sensors 2B, 2C, and 2D inherently vary dynamically with the operation of the vehicle).

Regarding Claim 30, Koike discloses an apparatus for synthesizing sound signals associated with a vehicle having an engine (Figure 1), comprising: an engine control input which provides at least one engine control parameter characterizing a corresponding engine operating condition (rotational speed sensor 2B), a vehicle control input which provides at least one vehicle control parameter characterizing a corresponding vehicle operating condition other than an engine operating condition (vehicle speed sensor 2C), an engine related sound signal synthesizer (simulated sound source device 4) which generates at least one engine related sound signal corresponding to said engine control parameters (signals 4a and 4b), and a vehicle sound signal synthesizer (sound source device 4) which generates at least one vehicle sound signal (signals 4a and 4b)corresponding to said vehicle control parameters.

Regarding Claim 31, Koike further discloses said vehicle control parameter comprises vehicle speed (speed sensor 2C).

Regarding Claim 32, Koike further discloses vehicle sound signal corresponding to vehicle speed comprising at least one of road noise, wind noise, tire noise, and water noise. (Koike discloses sound signal 5b is a function of vehicle speed 2C and noise sensor 10 which detects ambient noise (i.e. road, wind, tire, and water noise) (Column 2, lines 13-15).

Regarding Claim 33, Koike further discloses said engine related and vehicle sound signals are controlled independently (controlled by independent sensors 2A, 2B, 2C, and 2D).

Regarding Claim 34, Koike further discloses engine related and vehicle sound signals are mixed together to produce a combined audio output (mixed together in level selector 13 to produce output of device 5).

Regarding Claim 35, Koike further discloses at least some of said engine control and vehicle control parameters are dynamically varying (It is inherent that vehicle speed and rotational speed will vary dynamically).

Regarding Claim 36, Koike further discloses said engine related and vehicle sound signals are generated concurrently (sensors 2B and 2C control sound selector 12).

Regarding Claim 37, Koike discloses an apparatus for synthesizing sound signals associated with a vehicle having an engine (Figure 1), comprising: a vehicle control input which provides at least one vehicle control parameter characterizing a corresponding vehicle operating condition other than an engine operating condition (Running sound selector 12), and a vehicle sound signal synthesizer (Figure 1) which

generates at least one respective vehicle sound signal corresponding to said vehicle control parameters (signal 4b).

Regarding Claim 38, Koike further discloses at least one of said vehicle control parameters comprising vehicle speed (Vehicle speed sensor 2C).

Regarding Claim 39, Koike further discloses vehicle sound signal corresponding to vehicle speed comprising at least one of road noise, wind noise, tire noise, and water noise. (Koike discloses sound signal 5b is a function of vehicle speed 2C and noise sensor 10 which detects ambient noise (i.e. road, wind, tire, and water noise) (Column 2, lines 13-15).

Regarding Claim 40, Koike further discloses vehicle sound signal synthesizer generates multiple vehicle sound signals (signals 2a, 2b, 2c, and 2d), and further comprising a mixer (sound level selector 13) connected to mix said vehicle sound signals together to produce a combined audio output (output of speaker 9) .

Regarding Claim 41, Koike further discloses said vehicle control input provides at least some of said vehicle control parameters as dynamically varying inputs (sensors 2B, 2C, and 2D inherently vary dynamically with the operation of the vehicle).

3. Claims 13-15, and 42-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Miller (US Patent 5,237,617).

Regarding Claim 13, Miller discloses a method of synthesizing sound signals associated with a vehicle having an engine (Figure 1), comprising: providing a plurality of engine control parameters which characterize respective engine control conditions

(rpm parameter 22, vacuum 23, and exhaust 24), and generating engine related sound signals corresponding to said engine control parameters (output of speakers 53).

Regarding Claim 14, Miller further discloses said engine control parameters are provided to an engine process model (provided to personality module (i.e. process model 38) at digital synthesizer 32), and said engine related sound signals (signals 39 and 41) are generated in response to an output from said engine process model.

Regarding Claim 15, Miller further discloses said engine control parameters comprising engine rotational speed (rpm signal 22), engine load (throttle signal 21), vehicle acceleration (throttle signals 21), transmission gear ratio (gear box signal 18), and throttle position (throttle signals 21).

Regarding Claim 42, Miller discloses an apparatus for synthesizing sound signals associated with a vehicle having an engine (Figure 1), comprising: an engine control input which provides a plurality of engine control parameters characterizing respective engine control conditions (rpm parameter 22, vacuum 23, and exhaust 24), and an engine related sound synthesizer (synthesizer 32) which generates engine related sound signals (outputs 39 and 41) corresponding to said engine control parameters.

Regarding Claim 43, Miller further discloses said engine control input provides said engine control parameters to an engine process model (provided to personality module (i.e. process model 38) at digital synthesizer 32), and said engine related sound signal synthesizer generates said engine related sound (signals 39 and 41) signals in response to an output from said engine process model.

Regarding Claim 44, Miller further discloses said engine control parameters comprising at engine rotational speed (rpm signal 22), engine load (throttle signal 21), vehicle acceleration (throttle signals 21), transmission gear ratio (gear box signal 18), and throttle position (throttle signals 21).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 16-18, 21-23, and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller as applied to claim 13 above in view of Plugge et al. (Hereinafter "Plugge") (US Patent 6,356,185).

Regarding Claim 16, Miller discloses a method as stated apropos of claim 13 above including outputs (signals 39 and 41) that comprise being the function of engine load (throttle 21), and engine rotational speed signals (RPM 22). Miller does not disclose the use of spark events in processing the signal outputs. Plugge discloses a method and apparatus for synthesizing sounds of automobiles using an engine spark plug sensor (Figure 2, sensor 20). Plugge discloses that the RPM sensor 5 takes the form of an engine spark plug sensor 20 (Column 4, lines 55-58). Therefore, it would have been obvious to use an engine spark plug sensor (i.e. spark event) as taught by

Plugge in combination with Miller in order to use the spark event to obtain a signal corresponding to RPM or engine speed.

Regarding Claim 17, Miller as modified further discloses spark timing controlled sound signals (sound signals 39 and 41) which are controlled and generated in part by spark timing signal (22) are also generated in response to engine load (signal 21) and spark event (signal 22) outputs from process model (38 and 32).

Regarding Claim 18, Miller further discloses engine rotational speed sound signals (sound signals 39 and 41) are generated in response to said engine load (throttle signal 21) and engine rotational speed (rpm signal 22) outputs from said engine process model (38 and 32).

Regarding Claim 21, Miller further discloses engine rotational speed sound signals (sound signals 39 and 41) are generated in response to said engine load (throttle signal 21) and engine rotational speed (rpm signal 22) outputs from said engine process model (38 and 32).

Regarding Claim 22, Miller further discloses said engine rotational speed related sound signals (signals 39 and 41) comprise of whistles and whines. (Miller discloses the engine noise increasing in pitch with RPM (i.e. whistles, and whines) (Column 4, lines 26-28).

Regarding Claim 23, Miller as modified further discloses said engine process model comprises an engine physical model (module 38 and synthesizer 32) which generates said spark event and engine rotational speed outputs (signals 39 and 41 function of spark event and rotational speed), and a load behavior model (Miller

discloses module 38 and synthesizer 32 contains behavior information) (Column 4, lines 8-25) which generates said engine load output (signals 39 and 41).

Regarding Claim 26, Miller discloses a method as stated apropos of claim 14 above including an engine load signal (Figure 1, throttle signal 21) and an RPM signal (22) which cooperate to generate an engine resonance sound signal (Column 4, lines 29-46). Miller does not disclose the use of a spark event. Plugge discloses a method and apparatus for synthesizing sounds of automobiles using an engine spark plug sensor (Figure 2, sensor 20). Plugge discloses that the RPM sensor 5 takes the form of an engine spark plug sensor 20 (Column 4, lines 55-58). Therefore, it would have been obvious to use an engine spark plug sensor (i.e. spark event) as taught by Plugge in combination with Miller in order to use the spark event to obtain a signal corresponding to RPM or engine speed.

Regarding Claim 27, Miller as modified further discloses said engine load (throttle signal 21) and spark event signals (signal 22) cooperate to generate an engine resonance sound signal (Miller discloses resonance in outputs) (Column 4, liens 29-32), and said engine load signal (throttle signal 21) and engine resonance sound signal (signal 27) cooperate to generate a turbulence sound signal (Miller discloses synthesizing exhaust noises, i.e. turbulence sound signal) (Column 4, lines 40-46).

Regarding Claim 28, Miller as modified further discloses said engine load (throttle 21) and spark event signals (signal 22) are supplied to an exhaust system model (Miller discloses synthesizer 32 produces exhaust signals) (Column 4, lines 40-43) that

includes turbulence (i.e. exhaust) and filtering resonance (Column 4, line 30) models to generate said exhaust system sound signal.

6. Claims 45-47, 50-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller as applied to claim 42 above in view of Plugge et al. (US Patent 6,356,185).

Regarding Claim 45, Miller discloses an apparatus as stated apropos of claim 42 above including outputs (signals 39 and 41) that comprise being the function of engine load (throttle 21), and engine rotational speed signals (RPM 22). Miller does not disclose the use of spark events in processing the signal outputs. Plugge discloses a method and apparatus for synthesizing sounds of automobiles using an engine spark plug sensor (Figure 2, sensor 20). Plugge discloses that the RPM sensor 5 takes the form of an engine spark plug sensor 20 (Column 4, lines 55-58). Therefore, it would have been obvious to use an engine spark plug sensor (i.e. spark event) as taught by Plugge in combination with Miller in order to use the spark event to obtain a signal corresponding to RPM or engine speed.

Regarding Claim 46, Miller as modified further discloses spark timing controlled sound signals (sound signals 39 and 41) which are controlled and generated in part by spark timing signal (22) are also generated in response to engine load (signal 21) and spark event (signal 22) outputs from process model (38 and 32).

Regarding Claim 47, Miller further discloses engine rotational speed sound signals (sound signals 39 and 41) are generated in response to said engine load

(throttle signal 21) and engine rotational speed (rpm signal 22) outputs from said engine process model (38 and 32).

Regarding Claim 50, Miller further discloses engine rotational speed sound signals (sound signals 39 and 41) are generated in response to said engine load (throttle signal 21) and engine rotational speed (rpm signal 22) outputs from said engine process model (38 and 32).

Regarding Claim 51, Miller further discloses said engine rotational speed related sound signals (signals 39 and 41) comprise of whistles and whines. (Miller discloses the engine noise increasing in pitch with RPM (i.e. whistles, and whines) (Column 4, lines 26-28).

Regarding Claim 52, Miller as modified further discloses said engine process model comprises an engine physical model (module 38 and synthesizer 32) which generates said spark event and engine rotational speed outputs (signals 39 and 41 function of spark event and rotational speed), and a load behavior model (Miller discloses module 38 and synthesizer 32 contains behavior information) (Column 4, lines 8-25) which generates said engine load output (signals 39 and 41).

7. Claims 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller as applied to claim 43 above in view of Plugge et al. (Hereinafter "Plugge") (US Patent 6,356,185).

Regarding Claim 55, Miller discloses an apparatus as stated apropos of claim 43 above including an engine load signal (Figure 1, throttle signal 21) and an RPM signal

(22) which cooperate to generate an engine resonance sound signal (Column 4, lines 29-46). Miller does not disclose the use of a spark event. Plugge discloses a method and apparatus for synthesizing sounds of automobiles using an engine spark plug sensor (Figure 2, sensor 20). Plugge discloses that the RPM sensor 5 takes the form of an engine spark plug sensor 20 (Column 4, lines 55-58). Therefore, it would have been obvious to use an engine spark plug sensor (i.e. spark event) as taught by Plugge in combination with Miller in order to use the spark event to obtain a signal corresponding to RPM or engine speed.

Regarding Claim 56, Miller as modified further discloses said engine load (throttle signal 21) and spark event signals (signal 22) cooperate to generate an engine resonance sound signal (Miller discloses resonance in outputs) (Column 4, liens 29-32), and said engine load signal (throttle signal 21) and engine resonance sound signal (signal 27) cooperate to generate a turbulence sound signal (Miller discloses synthesizing exhaust noises, i.e. turbulence sound signal) (Column 4, lines 40-46).

Regarding Claim 57, Miller as modified further discloses said engine load (throttle 21) and spark event signals (signal 22) are supplied to an exhaust system model (Miller discloses synthesizer 32 produces exhaust signals) (Column 4, lines 40-43) that includes turbulence (i.e. exhaust) and filtering resonance (Column 4, line 30) models to generate said exhaust system sound signal.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller as modified as applied to claim 18 above, and further in view of Redmann et al. (US Patent

5,633,993). Miller as modified discloses a method as stated apropos of claim 18 above including engine load and engine rotational speed outputs. Miller as modified does not disclose applying the outputs to cross-fade loops. Redmann et al. discloses a method for synthesizing sound which includes a cross-fading input channels to extend the dynamic capabilities of the controller and help localize continuous sounds (e.g. airplane engine noise) (Column 9, lines 13-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cross-fade loop in order to help the localization of continuous sounds such as an engine noise in a vehicle simulation.

9. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller as modified as applied to claim 47 above, and further in view of Redmann et al. (US Patent 5,633,993). Miller as modified discloses an apparatus as stated apropos of claim 47 above including engine load and engine rotational speed outputs. Miller as modified does not disclose applying the outputs to cross-fade loops. Redmann et al. discloses a method for synthesizing sound which includes a cross-fading input channels to extend the dynamic capabilities of the controller and help localize continuous sounds (e.g. airplane engine noise) (Column 9, lines 13-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cross-fade loop in order to help the localization of continuous sounds such as an engine noise in a vehicle simulation.

10. Claim 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Miller as modified as applied to claim 18 above, and further in view of Takeuchi et al. (US Patent 5,998,724). Miller as modified discloses a method as stated apropos of claim 18 above including engine load and engine rotational speed outputs. Miller as modified does not disclose applying the outputs to a feedback FM block. Takeuchi et al. discloses a synthesizing device including FM feedback to provide a variety of sounds from the synthesizer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include FM feedback in order to produce a variety of sounds from a synthesizer resulting in a more natural synthesized audio signal.

11. Claim 49 rejected under 35 U.S.C. 103(a) as being unpatentable over Miller as modified as applied to claim 47 above, and further in view of Takeuchi et al. (US Patent 5,998,724). Miller as modified discloses an apparatus as stated apropos of claim 47 above including engine load and engine rotational speed outputs. Miller as modified does not disclose applying the outputs to a feedback FM block. Takeuchi et al. discloses a synthesizing device including FM feedback to provide a variety of sounds from the synthesizer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include FM feedback in order to produce a variety of sounds from a synthesizer resulting in a more natural synthesized audio signal.

Allowable Subject Matter

12. Claims 24, 25, 29, 53, 54, and 58 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM

XU MEI
PRIMARY EXAMINER